

Paper Conference and Trade Show 2009

(PaperCon 09)

**St. Louis, Missouri, USA
31 May – 3 June 2009**

Volume 1 of 7

ISBN: 978-1-61567-447-3

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2009) by the TAPPI Press
All rights reserved.

Printed by Curran Associates, Inc. (2009)

For permission requests, please contact the TAPPI Press
at the address below.

TAPPI Press
15 Technology Parkway South
Norcross, Georgia 30092

Phone: (800) 332-8686
Fax: (770) 209-7206

tappipress@brighkey.net

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2634
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

VOLUME 1

SESSION 6 – COATING FUNDAMENTALS CIG LUNCH & LEARN

What Do Papermaker's Need to Know About Optical Dot Gain?	1
<i>David Smith</i>	

SESSION 9 – PIMA INNOVATION I

Lessons of Collaborative Innovation for the Forest & Paper Industry: The ABC's of Collaborative Innovation	46
<i>D. Carter</i>	
Tough Times for Innovators: What Can We Learn from Hall of Fame Inductees	82
<i>A. Button, D. Lee, H. Spiegelberg</i>	
Lighting the Way to Innovation	99
<i>N. Verfuert</i>	

SESSION 10 – PAPER MACHINE MEASUREMENT AND PERFORMANCE KICK- OFF

Measuring Paper Machine Performance	121
<i>D. Reese</i>	

SESSION 11 – CONTROL PERFORMANCE INDICES & THEIR APPLICATIONS

A Fresh Look at Feed Forward Control	147
<i>W. Henry, D. Crain</i>	
Basis Weight Variability as a Key Performance Index	178
<i>J. Tippett</i>	
Quality Control System Performance – A Review to Evaluation Practices	216
<i>M. Makela, H. Vehvilainen</i>	
VPA and New Indices for Quantifying Sheet Quality and Troubleshooting	257
<i>S. Chen, I. Journeaux</i>	

SESSION 12 – BEST PRACTICES FOR MICROBIAL CONTROL

5,5-Dimethylhydantoin (DMH) a Highly Effective, Halogen Stabilizer for Wet End Applications	289
<i>M. Ludensky, S. Kopecky, K. Janak, P. Sweeny</i>	
Management of Broke Spoilage	322
<i>L. Rice, J. Kiuru, P. Tukianinen, A. Weber</i>	
Best Practices for Microbial Control in Additives	349
<i>K. Bottjer, L. Chaney</i>	
Best Practices for Influent Water Treatment	383
<i>C. Rocks, F. Ervin, J. Woodward</i>	

SESSION 13 – DEFINING SUSTAINABILITY FOR PACKAGING

Fundamental Principles and Concepts of Biodegradability - Sorting Through the Facts, Hypes, and Claims of Biodegradable Products in the Marketplace	407
<i>R. Narayan</i>	
Johnson & Johnson Triple Bottom Line	418
<i>S. Anello</i>	

SESSION 15 – PIMA INNOVATION II

Driving Growth Through Innovation at Neenah Paper 458
S. Rosenberg

Biorefining and Alternative Energy Research..... 474
H. Cullinan

SESSION 16 – PULP & WET END PM MEASUREMENTS & PERFORMANCE

Papermakers, Are You Getting the Pulp Property Information You Need?..... 488
A. Button

Refiner System Monitoring and Control Strategies..... 510
S. Berg

Best Practices for the Stability and Agility of a Production Line 565
S. Nuyan

VOLUME 2

SESSION 17 – FORMING AND FORMING FABRICS

Effects of Forming Fabric Design on Drainage, Paper Quality, and Linting – Pilot Machine Trials..... 618
F. Forel, J. Jong, J. Orccotoma, F. Fournier

The Effect of Center Plane Resistance on the Drainage and Sheet Forming..... 669
J. Xu, R. Danby, D. Johnson, J. Vanderkolk, B. Janda

Influence of Machine-Side Filaments and Jet-to-Wire Speed Ratio on the Flow Through a Forming Fabric..... 703
A. Vakil, A. Olyaei, S.Green

SESSION 18 – MONITORING METHODS FOR MICROBIAL GROWTH – PANEL DISCUSSION

General Plating Techniques – Pros & Cons 738
J. Woodward

ATP - Rapid Analysis of Microbial Activity 748
M. Kolari

Anaerobes: What You Can't See Can Hurt Your Company's Products (and You) 755
L. Robertson

Identification and Speciation of Microorganisms in Pulp and Paper Systems 764
T. Williams

SESSION 19 – COATED PAPER CONTRIBUTION TO CARBON FOOTPRINT REDUCTION

Mill Experiences with Biobased Latex in Brazil 777
F. Figliolino, F. Rosso, J. Leeuwen, C. Klass

It's not Easy Being (Truly) Green 828
N. Goodrich

SESSION 20 – PROFITABILITY IMPROVEMENT

The Use of Pro-Active Monitoring Strategies for Optimized Control of Coating and Additive Spoilage 853
L. Rice, T. Schild

Pond Size Press Pigmentation with Platy Kaolin 878
R. Wygany, G. Lucidi, J. Kendrick

SESSION 22 – PIMA INNOVATION III

Conquering Innovation Fatigue in the Pulp and Paper Industries..... 919
J. Lindsay, C. Perkins, M. Karanjikar

Cascades' Innovation Management System and Examples of Sustainable Innovations 929
R. Gaudreault, N. Withington

Fiber Engineering: Opportunities for Innovation..... 966
G. Baum

SESSION 23 – RELIABILITY MEASUREMENT

Take the Fudge out of Paper Machine Performance Calculations 1005
M. Latino

Reliability and Maintenance Performance Measurement 1078
C. Idhammar

Domtar Espanola Reliability Case Study..... 1097
G. Clackett, D. Fitzgerald

Enhancing Productivity Through Improved Maintenance Operations 1118
M. Pousette

SESSION 24 – REDUCING PM VARIABILITY IN THE THIN & THICK STOCK FLOW LOOPS - TUTORIAL

Reducing Variability in the Thick Stock System..... 1137
K. Starr, T. Murphy

Reducing Variability in Low Consistency Refining 1179
S. Berg

Approach Flow Considerations for Reduced Variability 1216
B. Blount, B. Reed

VOLUME 3

Stabilizing Saveall Filter Operations..... 1273
J. Milliken

SESSION 25 – INNOVATIONS IN RETENTION & DRAINAGE TECHNOLOGY

New Nanoparticle Silica Technology Advances Limits of Retention and Drainage Performance 1295
M. Zempel

Filler Modification Engineering for Improved Paper Properties and Papermaking Process 1322
D. Song, C. Dong, A. Ragauskas, Y. Deng

Second Generation Advanced Retention and Drainage Technology Continues to Improve Operational Efficiencies and Reduce Operating Costs 1382
J. Hochu

Novel Retention Technologies Improve Ash Retention and Productivity 1416
L. Oqvist, M. Brocher, N. Sieverling, L. Anker

SESSION 26 – PAPER MACHINE AND VACUUM SYSTEM ENERGY CONSERVATION

Measuring Paper Machine Energy Performance..... 1444
D. Reese

Reducing Energy Intensity in Papermaking through Energy Efficiency 1480
T. Wroblewski

Ten Myths Revealed about Paper Machine Vacuum Systems and Related Processes..... 1515
D. Sweet

SESSION 28 – CHARACTERIZATION AND ANALYSIS OF COATING STRUCTURE

Contribution of Surface and Bulk Scattering to the Gloss of Coated Papers	1520
<i>T. Takahashi, R. Farnood</i>	
Coating Structure Influence on Flexographic Printing	1566
<i>D. Ma, D. Bousfield</i>	
Coated Paper Microstructure: Particle Shape - Microstructure Interrelations	1602
<i>J. Preston, M. Toivakka, P. Heard, G. Chinga-Carrasco</i>	
Influence of Application Method on Coating Structure	1651
<i>A. Chatani</i>	

SESSION 32 – IMPROVING GRADE CHANGE PERFORMANCE

Multivariable CD Control of a Large Linerboard Machine Utilizing Multiple Multivariable MPC Controllers	1697
<i>C. Gheorghe, A. Lahouaoula, J. Backstorm, P. Baker</i>	
Simplified Approach for Paper Dryer Modeling	1723
<i>S. Senthilmurugan, T. Mathur</i>	
Multivariable Control and Energy Optimization of Tissue Machines	1747
<i>S. Chu, R. Machattie, J. Backstrom</i>	

SESSION 34 – WET END ENERGY CONSERVATION

The Impact of Specialty Chemical Programs on Mill Energy Use	1772
<i>L. Wesoloski</i>	
Innovative Mixing of 6%-14% Consistency Stock Vessels for Improved Quality and Energy Savings	1809
<i>M. Moseley, W. Wyczalkowski</i>	

SESSION 35 – ALTERNATIVE BARRIERS

High Performance Talc for Water-Based Barrier Coatings	1841
<i>F. Wu, Y. Rabot</i>	
A Natural Polymer for Water Based OGR Coatings	1856
<i>B. Kearney</i>	
The Role of High Performance Latexes in Aqueous Barrier Coating	1866
<i>S. Ottone</i>	
Hyper-Platy Kaolins for Improved Barrier Performance	1889
<i>P. Meizanis</i>	

SESSION 36 – PAPER SURFACE PROPERTIES

Preparation of Electroconductive Paper by Coating Blends of Poly(3,4-ethylenedioxythiophene)/Poly(4-styrenesulfonate) (PEDOT:PSS) and Organic Solvents	1910
<i>Elson Montibon</i>	

VOLUME 4

Improved Prediction of Offset Ink Setting Rates Based on Experimental Data and Filtration Equations	1952
<i>H. Koivula, D. Bousfield, M. Toivakka</i>	
Surface Energy of Coated Paper: Effect of Calendaring Conditions and Relative Humidity	1987
<i>H. Bohra, P. Fleming, M. Joyce</i>	

SESSION 38 – PAPER MACHINE DATA MANAGEMENT

Integrated Tools Help Maximize Machine Performance	2043
<i>R. Baldus, D. Ferguson</i>	

Energy Management Using a Real-Time Enterprise Infrastructure	2078
<i>D. Stockford</i>	
Tools for Pulp and Paper Manufacturers to Control Costs and Increase Profits Enterprise-Wide	2101
<i>J. Pigott</i>	

SESSION 39 – MD WEIGHT VARIABILITY IN THE TIME SCALE OF 1 MIN – 1 HZ – PANEL DISCUSSION

Low Frequency Variability	2161
<i>P. Taber</i>	
Long Term, Machine Direction Basis Weight Variability	2175
<i>T. Balsler</i>	
Low Frequency MD Variations: Some Case Histories	2195
<i>J. Ewald</i>	

SESSION 40 – FILLER TUTORIAL

Paper Pigment Fillers- Tutorial	2227
<i>S. Yeakey</i>	

SESSION 41 – DRYER SECTION ENERGY CONSERVATION

Energy Focused Dryer Performance Indicators	2287
<i>J. Chaloux</i>	
A Systematic Approach to Optimize Dryer Performance and Energy Savings – Case Studies	2317
<i>A. Ghosh</i>	
Dryer Fabrics and Energy Consumption in the Drying Section	2373
<i>I. Lang</i>	

SESSION 41 – DRYER SECTION ENERGY CONSERVATION

The INVO® Tip	2401
<i>P. Emilsson</i>	
Efficiency Increasing Solutions	2423
<i>M. Schmid, M. Kustermann</i>	
Paralign Roll Alignment Service	2438
<i>T. Coombes</i>	
Improving Papermaking & Coating Efficiency with Web Inspection Cameras	2449
<i>K. Hilden</i>	
A New, High-Performance PFOA-Free Fluoro Chemical for Oil & Grease Resistant Paper and Paperboard	2481
<i>F. Adamsky</i>	
Energy Recovery System	2486
<i>S. DeFrance</i>	
Advanced Image Analyses for the Pulp and Paper Industry	2498
<i>R. Trepanier</i>	
Innovative Technologies for Boosting Performance – Br@incube Performance System Introduction	2512
<i>H. Olphe-Galliard</i>	

SESSION 43 – METERING SIZE PRESS TUTORIAL

Development and Applications of the Metering Size Press	2523
<i>C. Klass</i>	

VOLUME 5

SESSION 46 – PRESS SECTION MEASUREMENT & PERFORMANCE

Reducing Variability in the Press Section	2596
<i>D. Hédou</i>	
Press Section Performance Monitoring	2619
<i>K. Lantz, R. Machattie</i>	
Maximizing Machine Efficiency in the Press Section for Graphic Papers	2644
<i>R. Lowe, M. Callejo, T. Lemerande, B. Barlow</i>	
Extending the Press Section Lifetime Through a Mini Shoe Press Rebuild	2674
<i>F. Swietlik, T. Pirinen, J. Onnela, J. Snellman</i>	

SESSION 47 – FILLER TECHNOLOGY INNOVATIONS

Going from Acid to Neutral Papermaking and GCC Filling in Newsprint	2708
<i>L. Morimanno</i>	
Improved Productivity in Linerboard Using Kaolin Filler	2759
<i>L. Mclain, R. Wygant, P. Veal, B. Smith, E. Turner</i>	
Carbon Dioxide Based Applications for Optimization of Calcium Carbonate Containing Papermaking Processes	2798
<i>A. Jansson</i>	
An Innovative Process to Manufacture Calcium Carbonate by the Causticizing Process in a Kraft Pulp Mill	2824
<i>H. Komno, H. Goto, K. Takahashi, Y. Nari</i>	

SESSION 48 – ADDITIONAL ENERGY CONSERVATION OPPORTUNITIES

Cost Savings With an Effective Chemicals Mixing System at Mitsubishi Paper Hachinohe Mill PM7	2872
<i>J. Matula, K. Sato, R. Watanbe</i>	
Life Cycle Cost Based Optimization of PM Heat Recovery System for Machine Room Ventilation	2930
<i>K. Riihimaki</i>	
Insulation, the Forgotten Technology	2949
<i>R. King</i>	

SESSION 49 – NEW TECHNOLOGY SHOWCASE II

Tieto WebTrim: Business Growth Through Improved Efficiency	3000
<i>J. Pigott</i>	
Garlock Multi-Swell Presentation	3013
<i>S. Folk</i>	
Trial of a New Three Layers Super Stratified Pickup Press Fabric on a Newsprint Machine	3026
<i>J. Leboeuf</i>	
School Without Walls: A New Online and Collaborative Training Solution	3044
<i>M. Labrie</i>	
New DIP System for Newsprint Grades: Reduction of Energy Consumption, Increase of Yield	3060
<i>J. Kerr</i>	
SMART® Roll Continuous Nip Profiling	3075
<i>B. Butterfield</i>	
New Nanoparticles Silica Technology Pushes Retention and Dewatering Performance	3087
<i>M. Zempel</i>	
The AIRE-O₂ Triton Process Aerator	3098
<i>W. Randall</i>	
L&W Introduce a New Fast On-line Pulp Quality Testing with Laboratory Precision for Reduced Variability	3116
<i>P. Warendh</i>	

Santasalo® - Mechanical Drive Solutions with Life-Cycle Support for the Pulp & Paper Industry	3135
<i>T. Kukko</i>	

SESSION 51 – CLOTHING PERFORMANCE MONITORING – PANEL DISCUSSION

Clothing Performance Monitoring – Panel Discussion	3149
<i>D. Reese, D. Buchanan, D. Burton, E. Diamond, J. Neun</i>	
Press Section Monitoring	3153
<i>J. Neun</i>	

VOLUME 6

Measuring Paper Machine Clothing Performance	3177
<i>E. Diamond</i>	
Bringing Value Added in the Press Section	3190
<i>D. Buchanan</i>	
TAPPI Clothing Panel	3220
<i>D. Burton</i>	

SESSION 53 – GREEN PAPERMAKING ADDITIVES

Green Papermaking - Chemical Innovation to Improve Environmental Impact	3256
<i>M. Obyrne</i>	
The Promise of Biobased and Biodegradable Polymer Materials in Paper & Paperboard Products Reducing Carbon Footprint and Improving Environmental Performance	3302
<i>R. Narayan</i>	
Agricultural Based Solvent Cleaners for the Pulp and Paper Industry	3309
<i>G. Thomas</i>	
New Biosolvent Technology Addresses Environmental, Health, and Safety Issues of Traditional Solvents	3333
<i>M. O'Byrne, M. Miller</i>	

SESSION 54 – COATING STRUCTURE EFFECTS ON PRINTABILITY

Definition and Model for Primary Grey Scale Mottle as a Variation in the Yule-Nielsen Effect in Offset Printed Coated Paper	3367
<i>D. Smith, D. Williams, P. Salminen, G. Welsch, W. Heeschen, N. Nicholas, J. Arney</i>	
Precoat and Topcoat Effects on Final Printability – Part 2: Coating Structure Analysis With Mercury Intrusion	3487
<i>D. Matte, A. Dimmick, J. Saari, P. Mangin, C. Daneault</i>	
Investigation into the Coating Layer Requirements for Compatibility with Multiple Inkjet Ink Sets	3537
<i>P. Fleming, M. Joyce</i>	
Interactions Between Flexographic Ink and Porous Coating Structures	3586
<i>P. Gane, C. Ridgway</i>	

SESSION 55 – ADVANCES IN ROLL COVER TECHNOLOGY – PANEL DISCUSSION

Coater Backing Roll Information	3637
<i>B. Carney</i>	

SESSION 56 – METERING SIZE PRESS TUTORIAL

Speed Sizer the "Evergreen" of Film Presses	3664
<i>M. Kustermann, M. Schmid</i>	
Metered Size Press Coating - What to Expect from Advanced Coating Starches	3681
<i>D. Glittenberg</i>	

MSP Runnability and Synthetic Binders	3723
<i>S. Sabourin</i>	
Pigment Options in Metering Size Press	3751
<i>R. Iyer</i>	

SESSION 60 – MD WEIGHT VARIABILITY IN THE FREQUENCY RANGE OF 1- 40 HZ – PANEL DISCUSSION

MD Variability 1 to 40 Hz	3784
<i>P. Kristopeit</i>	
High Frequency Variability	3797
<i>P. Taber</i>	

VOLUME 7

Machine Direction Periodic Basis Weight Disturbances more than 1 Hz	3806
<i>A. Timberlake</i>	
Sensodec Presentation	3825
<i>E. Jaatinen</i>	

SESSION 61 – SIZING INNOVATIONS

Fatty Acid-Starch Complex in the Application of Linerboard Surface Sizing	3864
<i>Y. Jinhua, D. Yulin</i>	
Dramatic Enhancements to the InkJet Printability of Uncoated Paper	3906
<i>D. Varnell</i>	
Alternative ASA Technology	3947
<i>M. Ruiz</i>	

SESSION 64 – PAPER MACHINE AUXILIARY SYSTEM MEASUREMENT PERFORMANCE

Practical On-Line Vibration Monitoring for Papermachines	3966
<i>J. Robichaud</i>	
Paper Machine Room Ventilation Guidelines	4060
<i>J. Nielsen</i>	
EMVECO Profiling to Reduce Smoothness Variability	4110
<i>L. Gentile, G. Cothran</i>	
Raised Productivity with Virtual Sensors	4132
<i>J. Haag, N. Hardt</i>	
Optimized Cross Direction Control of Weight and Porosity	4168
<i>A. Lahouaoula, R. Machattie</i>	
Next Generation Optical Caliper Sensor Technology	4181
<i>R. Naimimohasses, A. Hellstrom</i>	

SESSION 66 – INNOVATIONS IN DEPOSIT CONTROL TECHNOLOGY

Advanced Control of Hydrophobic Contaminants in the Paper Machine Wet End	4214
<i>L. Sherman, M. Murcia, R. Jenzer, A. Gerli</i>	
Sustainable Cleaning and Deposit Control	4240
<i>J. Schwamberger, G. Baker</i>	
How Can Measuring Colloidal Organic Variability Improve Paper Machine Runnability	4277
<i>R. Haynes</i>	

SESSION 68 – FIBER SCALE FORMATION PANEL DISCUSSION

Variability in Basis Weight and Fiber Orientation in Forming Fiber-Scale Modeling	4310
<i>C. Aidun, J. Wu</i>	

Wet-End Chemistry of Papermaking and Paper Formation: Theory and Practice	4335
<i>Y. Deng</i>	
Modeling of Flexible Fiber Suspensions and Web Formation	4372
<i>D. Qi</i>	

SESSION 69 – INNOVATIONS IN STRENGTH TECHNOLOGY

Strength for the Future - Modern Concepts and Mechanisms	4381
<i>A. Esser</i>	
Use of PLA as a Paper - Reinforcing Agent	4420
<i>A. Hasan, B. Bujanovic, T. Amidon</i>	

POSTER SESSION

Shielding: New Insight to the Relationship between Formation and Strength	N/A
<i>J. Considine</i>	
Highly Substituted Ethylated Starches – Starch/Latex Optimization for Significantly Reduced Raw Material Costs	N/A
<i>Adam Schmidt</i>	
Comparative Study of Use of Non- Magnaetic Fraction of Pulverized Coal Fly-Ash and TiO₂ as Filler in Specialty Paper Manufacturing	4451
<i>A. Sinha, M. Singh, S. Singh</i>	
Impact of Z-Direction Fiber Orientation on Performance of Commercial and Laboratory Linerboards	N/A
<i>David W. Vahey</i>	
Author Index	